\$ GP 1752

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Ronald Sinclair Nohr et al.

Serial No. 09/407,007

Filed: September 28, 1999

For: Novel Photoinitiators and Applications Therefor

Art Unit: 1752
Examiner:



INFORMATION DISCLOSURE STATEMENT

FEB 1 5 2000

Assistant Commissioner for Patents

Washington, DC 20231

Sir:

The citation of information on the attached Form PTO-1449, "List of Art Cited by Applicant" is made pursuant to 37 C.F.R. §§ 1.97 and 1.98. A copy of each cited item is enclosed unless stated otherwise hereinbelow.

The above-referenced application is one of a group of patent applications dealing with various technical aspects of chemistry relating to chemical compounds and compositions that are capable of the capture and transfer of electromagnetic radiation and the uses of these compounds and compositions in photocuring and dye technology (hereinafter the "Technology"). These applications are listed on the attached Appendix A for your reference. Applicants respectfully request that the Examiner review the applications listed in Appendix A, initial Appendix A in the appropriate spaces, and return a copy of the initialized Appendix to Applicants.

Applicants have conducted the following searches for each of the following technical aspects of the Technology:

• State of the art search directed towards photocuring compositions and methods.

- State of the art search directed towards an arylketoalkene compound and methods for stabilizing colorants or generating reactive species using the same.
- State of the art search directed towards novel pre-dye and leuco pre-dye compositions and methods of developing color using the same.
 - Patentability search directed to ink jet ink compositions
 - Patentability search directed to mutable colorant compositions
- Patentability search directed to the use of mutable colorant compositions on machine readable forms.
- Patentability search directed to the use of mutable colorant compositions in dry imaging processes.
- Patentability search directed to the use of mutable colorant compositions in methods for storing information.
- Patentability search directed to dye stabilization with dehydrated phthaloylglycine-2959.
- Patentability search directed to dye stabilization by association with cyclodextrins.
- Patentability search directed to dye stabilization to light, or lightfastness to dyes.
 - Patentability search directed to dye stabilization in general.

Although Applicants are under no duty to categorize the references disclosed herein, Applicants have made a good faith effort to do so in a manner most likely to assist the Examiner in his or her review of the references. To further assist the Examiner in his or her review of the enclosed references, those references that have been cited in Office Actions relating to the applications listed in Appendix A have a superscript identifying in which application of Appendix A the reference was cited. Further, those references that have been cited in Office Actions from any foreign country have a superscript identifying in which

application and country the reference was cited. To even further assist the Examiner, Applicants specifically direct the Examiner's attention to references having an asterisk as being of specific interest to the above-referenced application. Please note that the categorization of the references serves as the concise explanation of the relevance of any reference that is not in the English language as required under 37 C.F.R. § 1.98 (a)(3).

As all of the references found in the Applicants' searches and obtained from other sources relate to the overall research and development of the Technology, Applicants hereby cite the following references to discharge their duty under 37 C.F.R. § 1.56 to disclose all information known to the undersigned attorney and the Applicants that may be material to patentability:

The Following References Relate to Thermally, Mechanically, or Chemically Mutable Colorant Compositions that do not include Photoiniators, Photosensitizers or Photoreactive Compositions

	PTO-1449	J.S. Patents		FEB 1 5 2000 %
Cited in:	<u>No.</u> 102	5,372,917	Tsuchida et al.	FEB 1 5 2000 G
	128	5,296,556	Frihart	HADENI
	256	4,985,345	Hayakawa et al.	
	337	4,720,450	Ellis	
	352	4,663,641	Iiyama et al.	
	357	4,638,340	Iiyama et al.	
	392	4,460,676	Fabel	

	410	4,376,887	Greenaway o	et al.		
	412	4,373,020	Winslow			
	415	4,370,401	Winslow et	al.		
	430	4,336,323	Winslow			
	463	4,262,936	Miyamoto			
OIPE CO	545	Re 28,225	Heseltine et	al.		
FEB 1 5 2000	597	3,514,597	Haes et al.			
PADEMITTE	674	2,364,359	Kienle et al.			
	716	1,436,856	Brenizer et a	ıl.		
	PTO 1440	Foreign Patent	<u>s</u>			
Cited in:	PTO-1449 No. 749	0639664	Europe			
	749	0039004	Europe			
	848	63-48370	Japan			
	858	61-222789	Japan			
		Other Reference	<u>ces</u>			
Cited in:	PTO-1449 <u>No.</u>					
	971		Abstract for WO 95/00343 - A1	Textiles: Paper: Cellulose	pg. 7	1995
	1042		"German company develops reuseable paper"	Pulp & Paper		1991

The Following References Relate to Colorant Stabilizers

103

Colorant Stabilizers relating to Chalcones, Benzilidene Acetones, and Extended Conjugation

	p	<u>U</u> TO-1449	.S. Patents	
	Cited in:	No. 2	5,891,229	Nohr et al.
		8	5,885,337	Nohr et al.
		27	5,773,182	Nohr et al.
/	OIPE	42	5,700,850	Nohr et al.
	FEB 1 5 2000 %	149	5,224,476	Schultz et al.
K	A TRADEMARK STEEL	156	5,221,334	Ma et al.
		175	5,190,565	Berenbaum et al.
		204	5,124,723	Hugh S. Laver
		220	5,085,698	Ma et al.
		224	5,073,448	Vieira et al.
		283	4,902,787	Freeman
		289	4,874,391	Reinert
		307	4,812,139	Brodmann
		315	4,775,386	Reinert et al.
		381	4,524,122	Weber et al.

	547	3,840,338	Zviak et al.
OIPEYO	662	2,628,959	von Glahn et al.
FEB 1 5 2000 6	664	2,612,495	von Glahn et al.
TRADENARITE	676	2,356,618	Rossander et al.

		E	oreign Patents	
		PTO-1449		
	Cited in:	<u>No.</u>		
76W 117		730	97/20000	PCT
P WP				
		837	63151946	Japan
		- '		· · · ·
		845	6395439	Japan
		045	0373 137	Jupun
		846	6395440	Japan
		040	0393440	Japan
		020	4215662	T
		920	4315663	Japan
		934	552,565	Canada

Other References

	PTO-1449		
Cited in:	No.		
	1022	Abstract of patent, JP 03-220384	1991
	1118	Derwent Publications Ltd., London, J,A, 0011451 (Fugi Photo Film KK), 1/21/85. (Abstract)	1985
	1145	Derwent Publications Ltd., London, J,A, 0187289 (Honshu Paper Mfg KK), 11/17/82. (Abstract)	1982

19W 54W P P		1187	Karmanova, L.S. et al.	"Light stabilizers of daytime fluorescent paints"	Chemical Abstracts	82	147 [no 59971p]	1975
		Cole	orant Stabili	izers relating to A	ryliminealke	enes		
	Cited in:	<u>U</u> <u>PTO-1449</u> <u>No.</u>	J.S. Patents			٠		
		3	5,891,229	Nohr et al.		0	PE	
		9	5,885,337	Nohr et al.		FEB	1 5 2000	
			oreign Patent	<u>s</u>	•	To TRA	DEMARKOTT	
	Cited in:	<u>PTO-1449</u> <u>No.</u>						
76W 117 P WP		731	97/20000	PCT				
54W P		817	271512	Germany				
			Other Reference	<u>ces</u>				
	Cited in:	<u>PTO-1449</u> <u>No.</u>						
54W P		1114	John J. Eisch and Ramiro Sanchez	"Selective, Oxophilic Imination of Ketones with Bis (dichloroaluminum) Phenylimide"	J. Org. Chem.	51 (10)	1848-185 2	1986
Colorant Stabilizers relating to Group VII Ions								
	Cited in:	<u>U</u> <u>PTO-1449</u> <u>No.</u>	J.S. Patents	·				
	<u> </u>	4	5,891,229	Nohr et al.				
		10	5,885,337	Nohr et al.				
45		310	4,803,008	Ciolino et al.				

Singer et al.

4,276,211

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		<u>Fo</u> PTO-1449	oreign Patent	<u>s</u>		
76W 117	Cited in:	No. 732	97/20000	PCT		
P WP					10	<u> </u>
		764	680915	Japan	015	2000 6
		823	89014948	Japan	FEB 1 5	
		<u>O</u> PTO-1449	ther Reference	<u>ces</u>	TRADE	
	Cited in:	No.				
		1128		Derwent Publications Ltd., London, J,A, 0053563 (Dainippon Toryo KK), 3/28/84. (Abstract)		1984
		1129		Derwent Publications Ltd., London, J,A, 0053562 (Dainippon Toryo KK), 3/28/84. (Abstract)		1984
		1133		Derwent Publications Ltd., London, J,A, 0051961 (Dainippon Toryo KK), 3/26/84). (Abstract)		1984
		1208	Suppan, Paul	"Quenching of Excited States"	Chemistry and Light	65-69
-		Colo and	rant Stabili Derivatives	zers relating to Pl Thereof	henols Including	Iodophenols

	PTO-1449	U.S. Patents	
Cited in:	<u>No.</u> 5	5,891,229	Nohr et al.
	11	5,885,337	Nohr et al.
	261	4,964,871	Reinert et al.

		<u>F</u> <u>PTO-1449</u>	Foreign Patents	<u>S</u>	
76W 117 P WP	Cited in:	<u>No.</u> 733	97/20000	PCT	
		761	6116557	Japan	OIPE
		762	6116556	Japan	FEB 1 5 2000 6
		763	6116555	Japan	TRADEMANICAL
		839	6395447	Japan	
		840	6395446	Japan	
		841	6395445	Japan	
		842	6395448	Japan	
		843	6395449	Japan	
		844	6395450	Japan	
		890	57128283	Japan	
		<u>(</u> <u>PTO-1449</u>	Other Reference	<u>ees</u>	
6.4327	Cited in:	<u>No.</u>			
54W P		1198		Derwent World Patents Index,CS	1966

Colorant Stabilizers relating to Reducing Agents

120380 (Kocourek, Jan) 10/15/66.

		PTO-1449	J.S. Patents		
	Cited in:	<u>No.</u> 6	5,891,229	Nohr et al.	
		12	5,885,337	Nohr et al.	OIPE
		63	5,571,313	Mafune et al.	FEB 1 5 20
		68	5,531,821	Wu	TRADEMA
		229	5,057,562	Reinert	
		239	5,030,248	Meszaros	
		<u>F</u> <u>PTO-1449</u>	oreign Patents		
76W 117 P WP	Cited in:	No. 734	97/20000	PCT	
		894	56-24472	Japan	

Colorant Stabilizers relating to Crown Compounds

	<u> </u>	TO-1449	S. Patents	
	Cited in:	<u>No.</u> 7	5,891,229	Nohr et al.
67	103 109 76	15	5,855,655	Nohr et al.
67	103 109 76 102	26	5,782,963	Nohr et al.
		85	5,445,651	Thoen et al.
54	57	131	5,286,286	Winnik et al.

		133	5,282,894	Albert et al.
54	57	139	5,271,764	Winnik et al.
54	57	146	5,256,193	Winnik et al.
		246	5,017,195	Satou et al.
		260	4,966,607	Shinoki et al.
		286	4,892,941	Dolphin et al.
		303	4,834,771	Yamauchi et al.
		325	4,746,735	Kruper, Jr. et al.
		346	4,704,133	Reinert et al.
		367	4,614,723	Schmidt et al.
		404	4,400,173	Beavan
		507	4,077,769	Garcia
		588	3,579,533	Yalman
		624	3,248,337	Zirker et al.
		637	3,076,813	Sharp
		682	2,243,630	Houk et al.
		687	2,181,800	Crossley et al.



		698	2,090,511	Crossley et al.	
		700	2,058,489	Murch et al.	
		705	2,005,511	Stoll et al.	OIPE
		713	1,844,199	Bicknell et al.	FEB 1 5 2000 5
	<u>PT</u>	<u>Fc</u> 0-1449	oreign Patents		TRADEMAN OF
76W 117 P WP		<u>No.</u> 735	97/20000	PCT	

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<u>PTO-1449</u> <u>Cited in:</u> <u>No.</u>

45 58

968 Kubat et al. "Photophysical J. Photochem. 96 93-97 1996

properties of metal and Photobiol. complexes of

meso-tetrakis (40sulphonatophenyl

Colorant Stabilizers relating to UV Absorbers

	Ī	J.S. Patents	
	PTO-1449		
Cited in:	<u>No.</u>		
	73	5,498,345	Jollenbeck et al.
	74	5,489,503	Toan
	77	5,474,691	Severns
	171	5,197,991	Rembold
	180	5,181,935	Reinert et al.
103	218	5,089,050	Vieira et al.

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223	5,074,885	Reinert
238	5,030,243	Reinert
268	4,950,304	Reinert et al.
376	4,557,730	Bennett et al.
447	4,288,631	Ching
468	4,256,493	Yokoyama et al.
497	4,126,412	Masson et al.
502	4,105,572	Gorondy
505	4,085,062	Virgilio et al.
536	3,910,993	Avar et al.
603	3,464,841	Skofronick
608	3,415,875	Luethi et al.
611	3,363,969	Brooks
626	3,238,163	O'Neill
650	2,827,358	Kaplan et al.
666	2,580,461	Pearl
703	2,005,378	Kiel



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		<u>Fo</u> <u>PTO-1449</u>	oreign Patents	<u>S</u>		6	IPE	
76W 117 P WP	Cited in:	<u>No.</u> 736	97/20000	PCT	(FEB	1 5 2000	
		PTO-1449	ther Referenc	e <u>es</u>		TA TH	ADEMARK OF	
	Cited in:	<u>No.</u> 1054	Brennan et al.	"Stereoelectronic effects in ring closure reactions: the 2'-hydroxychalcone - flavanone	Canadian J. Chem.	68 (10)	pp. 1780 - 1785	1990
		1111	Sakai et al.	"A Novel and Practical Synthetic Method of 3(2H)-Furanone Derivatives,"	J. Heterocyclie Chem.	23	pp. 1199 - 1201	1986
		1175	Semple et al.	"Synthesis of Functionalized Tetrahydrofurans,"	Tetrahedron Letters	81	pp. 4561 - 4564	1980
		1194	Hosokawa et al.	"Ascofuranone, an antibiotic from Ascochyta," Japan Kokai 73 91,278 (11/28/73)	MERCK Index	80	pg. 283; abstract 94259t	1974
		Colo	rant Stabili	zers Generally				
	Cited in:	<u>U</u> <u>PTO-1449</u> <u>No.</u>	.S. Patents					

		_	J.S. Faterits	
		<u>PTO-1449</u>		
	Cited in:	<u>No.</u>		
		112	5,338,319	Kaschig et al.
		126	5,298,030	Burdeska et al.
45	103	144	5,261,953	Vieira et al.
10	54	150	5,244,476	Schulz et al.
		170	5,198,330	Martic et al.

	176	5,190,710	Kletecka
	191	5,160,346	Fuso et al.
45 103	213	5,098,477	Vieira et al.
	215	5,096,456	Reinert et al.
	216	5,096,781	Vieira et al.
	222	5,076,808	Hahn et al.
	226	5,069,681	Bouwknegt et al.
	241	5,028,262	Barlow, Jr. et al.
	266	4,952,680	Schmeidl
	282	4,902,299	Anton
	306	4,813,970	Kirjanov et al.
45	321	4,761,181	Suzuki
45	336	4,721,531	Wildeman et al.
	344	4,707,161	Thomas et al.
	350	4,672,041	Jain
	366	4,617,380	Hinson et al.
	368	4,613,334	Thomas et al.

373	4,567,171	Mangum
380	4,523,924	Lacroix
431	4,335,055	Blaser et al.
433	4,318,705	Nowak et al.
441	4,301,223	Nakamura et al.
456	4,271,252	Hara et al.
457	4,271,253	Hara et al.
459	4,269,926	Hara et al.
461	4,268,605	Hara et al.
462	4,254,195	Hara et al.
469	4,256,817	Hara et al.
473	4,248,949	Hara et al.
474	4,245,995	Hugl et al.
475	4,246,330	Hara et al.
476	4,245,018	Hara et al.
478	4,242,431	Hara et al.
479	4,242,430	Hara et al.



480	4,241,155	Hara et al.
481	4,239,843	Hara et al.
567	3,669,925	King et al.
569	3,668,188	King et al.
574	3,637,337	Pilling
575	3,637,581	Horioguchi et al.
591	3,563,931	Horiguchi
617	3,313,797	Kissa
622	3,282,886	Gadecki
632	3,133,049	Hertel et al.
649	2,834,773	Scalera et al.
651	2,809,189	Stanley et al.
653	2,773,056	Helfaer
654	2,768,171	Clarke et al.
663	2,612,494	von Glahn et al.
665	2,601,669	Tullsen
670	2,402,106	von Glahn et al.

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76W 117

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671	2,386,646	Adams et al.
673	2,381,145	von Glahn et al.
677	2,349,090	Haddock
683	2,237,885	Markush et al.
695	2,111,692	Saunders et al.
696	2,106,539	Schnitzspahn
712	1,876,880	Drapal
714	1,803,906	Krieger et al.
715	1,744,149	Staehlin
720	893,636	Maywald
721	582,853	Feer
722	575,228	von Gallois
PTO-1449	Foreign Patents	
<u>No.</u> 737	97/20000	PCT
757	0609159	Europe
795	3-203694	Japan

2282261

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Japan

879	2146357	United
913	1372884	United
916	4745409	Japan
918	4726653	Japan
922	1240811	Germany
926	1132540	Germany
938	537687	Canada
939	517364	Canada
940	483214	Canada
941	465495	Canada
942	465496	Canada
943	465499	Canada
944	463022	Canada
945	463021	Canada
947	460268	Canada
959	399753	United
960	413257	Canada



		962	349339	United		
		963	275245	Great Britain		
		964	424756	Japan	OIPER	
	a	PTO-1449	Other Referen	<u>nces</u>	FEB 1 5 2000 6	
	Cited in:	<u>No.</u> 981		Derwent Publications Ltd., London, J,A, 5-230410 (Seiko Epson Corp), 9/7/93. (Abstract)	RADEMARH SE	1993
		987		Abstract of patent, JP 5-195450 (Nitto Boseki Co. Ltd), 8/3/93.		1993
		1020		Derwent Publications, Ltd., London, JP 403269167 (Japan Wool Textile KK),		1991
54W P		1023		Patent Abstracts of Japan, JP 03184896 (Dainippon Printing Co Ltd.) 8/12/91.		1991
		1031		Abstract of patent, JP 03-41165		1991
		1043		Abstract of patent, JP 02289652		1990
54W P		1046		Patent Abstracts of Japan, JP 02141287 (Dainippon Printing Co Ltd.) 5/30/90.	· .	1990
		1069		Derwent Publications, Ltd., London, SU 1423656 (Kherson Ind Inst), 9/15/88		1988

	1070	Derwent Publications, Ltd., London, EP 0280653 (Ciba GeigyAG), 8/31/88 (Abstract)	1988
27W P	1073	Derwent World Patents Index, JP 63179977 (Tomoegawa Paper Mfg Co Ltd),	1988
	1077	Derwent Publications, Ltd., London, J6 3112770 (Toray Ind Inc), 5/17/88 (Abstract)	1988
	1078	Derwent Publications, Ltd., London, J6 3108074 (Konishiroku Photo KK), 5/12/88	1988
	1079	Derwent Publications, Ltd., London,J6 3108073 (Konishiroku Photo KK), 5/12/88	1988
	1082	Abstract of patent, JP 63-47762,	1988
	1083	Abstract of patent, JP 63-47763,	1988
	1084	Abstract of patent, JP 63-47764,	1988
	1085	Abstract of patent, JP 63-47765	1988
	1089	Derwent Publications, Ltd., London, J6 2270665 (Konishiroku Photo KK), 11/25/87	1987

1108		Derwent Publications, Ltd., London, J6 1041381 (Osaka Prefecture), 2/27/86 (Abstract)	01	P & 2000	Cas	1986
1119		Derwent Publications, Ltd., London J6 0011449 -A (Taoka Chemical KK) 1/21/85	THE TRA	5 2000		1985
1121	Roos, G. et al.	"Textile applications of photocrosslinkable polymers"		103	57 [no. 103:2369 0j]	1985
1125		Derwent Publications Ltd., London, J,A, 0169883 (Ricoh KK), 9/25/84. (Abstract)				1984
1130		Derwent Publications Ltd., London, J,A, 0053562 (Dainippon Toryo KK), 3/28/84. (Abstract)				1984
1141		Derwent Publications, Ltd., London, EP 0072775 (Ciba Geigy AG), 2/23/83 (Abstract)				1983
1148		Derwent Publications, Ltd., London J5 7139146 (Showa Kako KK) 8/27/82 (abstract)				1982
1150		Derwent Publications, Ltd., London, JA 0061785 (Nippon Senka KK), 4/14/82 (Abstract)				1982
1167		Derwent Publications Ltd., London, J,A, 0004488 (Canon KK), 1/17/81. (Abstract)				1981

1171	Derwent Publications, Ltd., London CA 1086-719 (Sherwood Medical) 9/30/80	1980
1183	Derwent Publications Ltd., London, J,A, 0012037 (Pentel KK), 1/29/77. (Abstract) FEB 1 5 2000	1977
1191	Derwent Publications, Ltd., London J4 9131-226 (TNational Cash Register C) 12/16/74	1974
1195	Abstract of patent, NL 7112489 (12/27/71).	1971
1197	Derwent Publications, Ltd., London SU 292698-S 1/15/71 (abstract)	1971
1213	Abstract of Patent, JP 405195450	

Colorant Stabilizers relating to the use of Phthaloyl Compounds

		<u>U</u> PTO-1449	J.S. Patents	
10	Cited in:	<u>No.</u> 308	4,812,517	West
		PTO-1449	Foreign Patents	
76W 117 P WP	Cited in:	<u>No.</u> 738	97/20000	РСТ
		889	57171775	Japan

The Following References Relate to Photoinitiators, Photosensitizers or Photoreactive Compositions Generally

References with a photoinitiator and a chromophore or sensitizer therein. These references will contain the combination of a compound that specifically absorbs light energy and then transfers it to the photoinitiator.

						<u>P</u>	<u>ΓΟ-1449</u>	S. Patents	
		<u>Ci</u>	<u>ted i</u>	<u>n:</u>			<u>No.</u> 16	5,849,411	Nohr et al.
68							19	5,811,199	MacDonald et al.
68							22	5,798,015	Nohr et al.
68							29	5,747,550	Nohr et al.
68							31	5,739,175	Nohr et al.
							35	5,721,287	Nohr et al.
68							38	5,709,955	Nohr et al.
68							44	5,685,754	Nohr et al.
44	48	68					67	5,532,112	Kohler et al.
34 66	42	31	20	29	35		82	5,455,143	Ali
						*	93	5,415,976	Ali
							100	5,376,503	Audett et al.
17	11						106	5,362,592	Murofushi et al.
26 10	30 73	37	41	60	100		110	5,340,631	Matsuzawa et al.
							111	5,340,854	Martic et al.

						* 113	5,334,455	Noren et al.
						118	5,312,721	Gesign
						120	5,312,713	Yokoyama et al.
						127	5,296,275	Goman et al.
18	23	25	28	39	21	136	5,275,646	Marshall et al.
6	14	68				143	5,262,276	Kawamura
						145	5,258,274	Helland et al.
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WP		170	,,132,302	Dane, 51.,
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WP		331	3,701,302	Hoptenberg et al.
			Earsian Datanta	
		PTO-1449	Foreign Patents	
	Citad in.	<u>No.</u>		
	Cited in:			_
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WP				
117		751	0 635 380	Europe
WP				

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<u>Cited in:</u>	<u>No.</u> 48	5,683,843	Nohr et al.		
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5 14	16 17	6	53	405	4,399,209	Sanders, et al.	2 - O B C S C S C S C S C S C S C S C S C S C	PRADEMARK OFFICE
7 4WP	17 16			551	3,799,773	Watarai er al.	10000000000000000000000000000000000000	M PRO
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	Cited	in:	-	No.				
				778	561220	Japan		
4WP 17	16			802	03163566	Japan		
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1	3	11	16	17	1200	Rigdon, J.E.	"In Search of Paper that Spies Can't Copy"	Wall Street Journal			

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Cited in:	No.				
	859	61-97025	Japan		
	(Other Referen	ices		
	PTO-1449				
Cited in:	<u>No.</u>				
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	1001		"Cyclodextrins: A	American	1993
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Colorant Stabilizing Compositions relating to Cyclodextrin

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Our Docket: 11300-0481

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